



What is claimed is:

**[01]** (Previously Presented -- Currently Amended) An architecture ~~A method and apparatus~~  
for the measurement of photomask optical path difference, ~~the apparatus~~ comprising:

A spatially coherent light source;

An interferometric beam processing module;

An optical microscope; and

A photosensitive detector;

Wherein said module is disposed to receive and divide light from said light source into a  
number of phase-coherent light beams, each of which passes through an aperture;

Wherein said microscope is disposed to image the multitude of said apertures in said  
module with a given demagnification onto a photomask in order to create a  
multitude of phase probes; and

Wherein said detector is disposed to receive the transmitted fringe pattern caused by the  
interference of the multitude of said phase probes;

~~and the method comprising the step of measuring the shift in interference fringe patterns  
recorded for different phase probe positions on the photomask.~~

**[02]** (Currently Amended) The ~~apparatus~~ architecture of claim 1 wherein said light source is a  
laser with a wavelength that is approximately the same as the actinic wavelength of said  
photomask.

**[03]** (Currently Amended) The ~~apparatus~~ architecture of claim 1 wherein said optical  
demagnification of said apertures is greater than 50.

**[04]** (Currently Amended) The ~~apparatus~~ architecture of claim 1 wherein said module is of the  
Mach-Zehnder (MZ) interferometer type.

1 **[05]** (Previously Presented -- Currently Amended) The ~~apparatus~~ architecture of claim 1  
2 wherein the relative optical phase between said phase probes may be varied by suitable  
3 adjustments to said module.

4 **[06]** (Currently Amended) The ~~apparatus~~ architecture of claim 1 wherein said module is a  
5 dual-aperture screen.

6 **[07]** (Canceled)

7 **[08]** (Currently Amended) The ~~apparatus~~ architecture of claim 1 wherein said detector is a  
8 UV-sensitive CCD camera.

9 **[09]** (Currently Amended) The ~~apparatus~~ architecture of claim 1 wherein said detector is a  
10 photomultiplier tube (PMT).

11 **[10]** (Previously Presented -- Currently Amended) The ~~apparatus~~ architecture of claim 1  
12 wherein the number of said phase probes is two (2).  
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1 **[11]** (Previously Presented -- Currently Amended) An architecture ~~A method and apparatus~~  
2 for the measurement of photomask optical path difference, ~~the apparatus~~ comprising:

3 A spatially coherent light source;

4 An interferometric beam processing module;

5 An optical microscope; and

6 A photosensitive detector;

7 Wherein said module is disposed to receive and divide light from said light source into a  
8 number of phase-coherent light beams, each of which passes through an aperture;

9 Wherein said microscope is disposed to image the multitude of said apertures in said  
10 module with a given demagnification onto a photomask in order to create a  
11 multitude of phase probes; and

12 Wherein said detector is disposed to receive the reflected fringe pattern caused by the  
13 interference of the multitude of said phase probes;

14 ~~and the method comprising the step of measuring the shift in interference fringe patterns~~  
15 ~~recorded for different phase probe positions on the photomask.~~

16 **[12]** (Currently Amended) The ~~apparatus~~ architecture of claim 11 wherein said light source is  
17 a laser with a wavelength that is approximately the same as the actinic wavelength of said  
18 photomask.

19 **[13]** (Currently Amended) The ~~apparatus~~ architecture of claim 11 wherein said optical  
20 demagnification of said apertures is greater than 50.

21 **[14]** (Currently Amended) The ~~apparatus~~ architecture of claim 11 wherein said module is of  
22 the Mach-Zehnder (MZ) interferometer type.

1 **[15]** (Previously Presented -- Currently Amended) The ~~apparatus~~ architecture of claim 11  
2 wherein the relative optical phase between said phase probes may be varied by suitable  
3 adjustments to said module.

4 **[16]** (Currently Amended) The ~~apparatus~~ architecture of claim 11 wherein said module is a  
5 dual-aperture screen.

6 **[17]** (Canceled)

7 **[18]** (Currently Amended) The ~~apparatus~~ architecture of claim 11 wherein said detector is a  
8 UV-sensitive CCD camera.

9 **[19]** (Currently Amended) The ~~apparatus~~ architecture of claim 11 wherein said detector is a  
10 photomultiplier tube (PMT).

11 **[20]** (Previously Presented -- Currently Amended) The ~~apparatus~~ architecture of claim 11  
12 wherein the number of said phase probes is two (2).

13 **[21]** (New) The apparatus of claim 1 wherein said module is of the Twyman-Green  
14 interferometer type.

15 **[22]** (New) The apparatus of claim 11 wherein said module is of the Twyman-Green  
16 interferometer type.